

Product Overview

Advantages

- Digital Image Transmission Remote Controller integrated: Data Link, Remote Control Link, Video Link integrated all-in-one
- The Remote Controller is equipped with a High-Definition screen, which is easy to use and highly integrated.
- HD video, low latency, long distance: video transmission can reach 1080p@60fps
- Data delay <110ms, transmission distance 20KM (ground-to-air, no occlusion without interference)
- Dual image input, Real-Time switching: Dual HDMI video input, users can switch video source through Remote Controller (display one video source at the same time)
- Open system, customizable development: The Remote Controller has built-in Android system, which will provide API for users to develop and use, and get the most out of the system.

Features

- Supports dual HDMI 1080P 60fps video input, which can be modified through the QGC interface.
- Dual S.bus signal output for simultaneous control of autopilot and pan/tilt cameras.
- The integrated digital transmission and image transmission can simultaneously transmit the flight data of the autopilot and the image output by the camera to the remote controller.
- Built-in QGC open source ground station with adaptable apm and px4 firmware for direct flight function.
- Independent Mavlink commands camera buttons and scroll wheel channels.
- Custom channel button and PWM value assignment.

Hardware Parameter

Technical specifications

Air Unit and Controller hardware information:

- Processor: SoC – Pinecone S1 AP: 4 x large core, Cortex A53, 2.2GHz 4 x small core, Cortex A53, 1.4GHz GPU: 4 core, Mali-
- T860 SDR: A7 + DSP Storage: Sky: LPDDR3: 1GB Ground: LPDDR3: 2GB Sky / Ground: EMMC: 4GB
- Transmission Distance: FCC 20km CE / SRRR 12km Image transmission delay: $\leq 110\text{ms}$ Image transmission: 720p@30fps 1080p@30 / 60fps transmission
- Frequency Band: 2.4GHz ISM Receive sensitivity: -99dBm@20MHz BW Interference recovery: < 1s

Air Unit:

- Appearance: core board + video daughter board + structure of RF daughter board
- Among them, the video daughter board completes the input bridge function of the

HDMI signal.

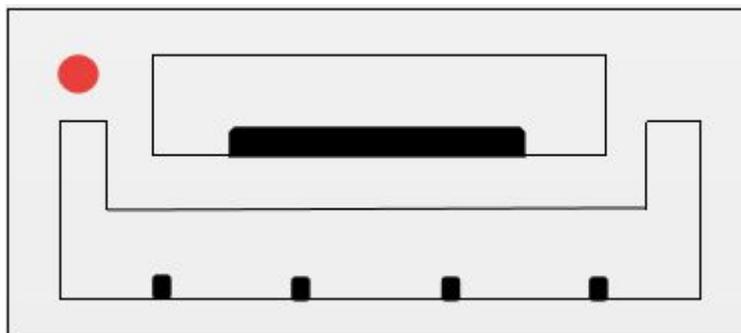
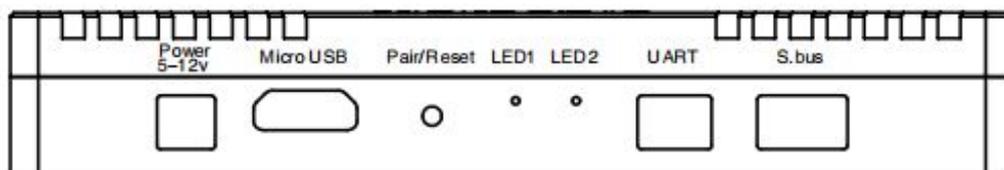
- The RF daughter board completes the function of transmitting and receiving signals
- M2 (E) connector connection between daughter board and core
- Size: 78.5x30x13mm
- Micro HDMI x 2: Input for external camera video signals
- 2 Pin interface x 1: 5V-12V power input interface
- 3 Pin interface x 1: 3.3V / 5V level UART interface
- 4 Pin interface x 1 : Two 3.3V level RC output connectors (S.bus in phase, S.bus inverting or PPM signal output, ground terminal control)
- Micro USB x 1: for debugging upgrades, support OTG mode
- Keyhole x 1: for frequency and status reset
- Indicator x 2: used to indicate the frequency and picture status
- MMCX antenna jack x 2: used for signal transmission and ground communication
- Signal bandwidth: 20MHz / 10MHz
- Power consumption: the average power consumption of the single-sided module is less than 4W

Controller:

- Housing: plastic
- Dimensions: 217 × 106.5 × 31mm (the whole machine does not contain external antenna and rocker)
- Screen: 5.46 inch, 1080P, 16 million colors, capacitive touch screen
- Audio: Built-in speaker × 1, built-in microphone × 2
- Remote control: rocker × 2, scroll wheel × 1, bottom button × 6, with backlight, top button × 1 (right)
- Communication : BT / WIFI / GPS 2.4G map transmission ground
- Indicator light: Top tri-color lamp × 2 (left, right)
- Interface: MicroUSB×1, TFlash×1 (supports maximum 64G expansion)
- Antenna: Orientation (5dBi) × 1 detachable, omnidirectional (2dBi) × 1 detachable
- Built-in wifi antenna, built-in GPS antenna, external GPS antenna interface
- Power : Built-in 4950 mAh Lipo Battery
- Charging : Support micro USB port 5v 2A current charging
- Power consumption: The average power consumption does not exceed 4W (only picture transmission work, medium screen brightness, WiFi off, GPS off)

Interface definition

Air Unit:



Red is Pin1

UART:

Pin #	Name	Description
1	RXD	RX of pinecone module, 3.3V/5V TTL
2	TXD	TX of pinecone module, 3.3V/5V TTL
3	GND	Ground pin

S.bus out :

Pin #	Name	Description
1	S.bus out 1	Signal channel 1
2	GND	Ground pin
3	S.bus out 2	Signal channel 2
4	GND	Ground pin

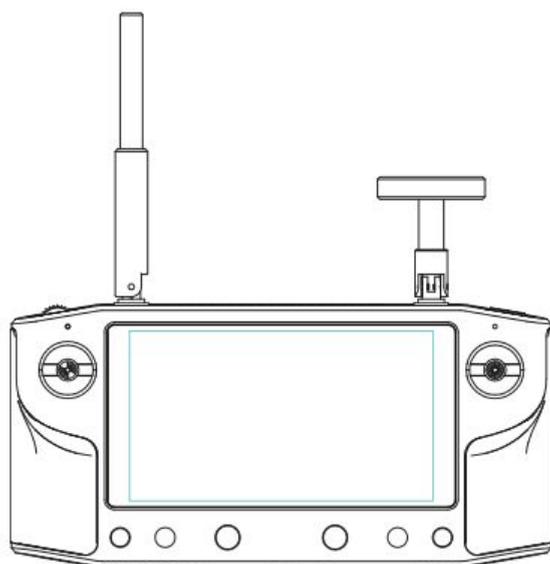
PWR :

Pin #	Name	Description
1	power	Power IN, 5-12V
2	GND	Ground pin

Product Size

Air Unit: 78.5 x 30 x 15mm

Controller: 217 x 106.5 x 31mm



Product Accessories

1. HereLink Air Unit*1
2. HereLink Controller*1
3. Air Unit antenna*2
4. Controller directional antenna*1
5. controller omni-directional antenna*1
6. HDMI cable*1
7. Power cord*1
8. Telem*1
9. S.bus*1
10. USB*1
11. Back board

12. M1.6, 14mm*4 (for fan)
13. M1.6 Nut*4 (for fan)
14. M1.6, 3mm*4 (for air unit and back board)
15. M3, 8mm*2 (for back board and drone)
16. M3 Nut*2 (for back board and drone)

System Structure

Introduction to operation settings

1. Air Unit and Controller normal working status indicator / button / remote control interface, etc.

1.1 Communication status indicator

LED1 (left):

- Flashing green light
- The green light is always on: A valid signal is received.
- Steady yellow light: No frequency / no valid signal received

Air Unit power status indicator:

- The green light is always on. The power is normal.
- Red light flashing
- Not lit, not working
- Video / data input status indicator

LED2 (right):

- The green light is always on: A video signal is received (??)
- The red light is always on: A video signal is received (??)
- The yellow light is always on: The flight control data signal is received.
- Green light red light change: Received two video signals
- Green light yellow light red light change: Received two video signals and flight control data signals
- Not lit: No valid video received / Flight control data signal

1.2 Controller button

- Top left wheel:
- Top right button:
- Button A below:
- Button B below:
- Switching machine button below: switch machine and unlock screen button
- Home button below: return to the ground station
- B button below: flight mode switching

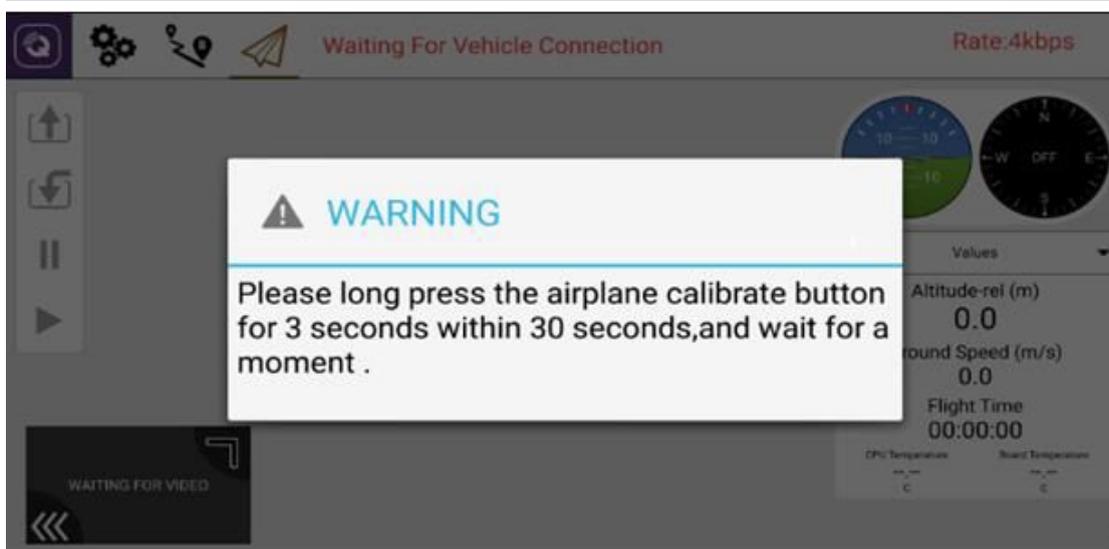
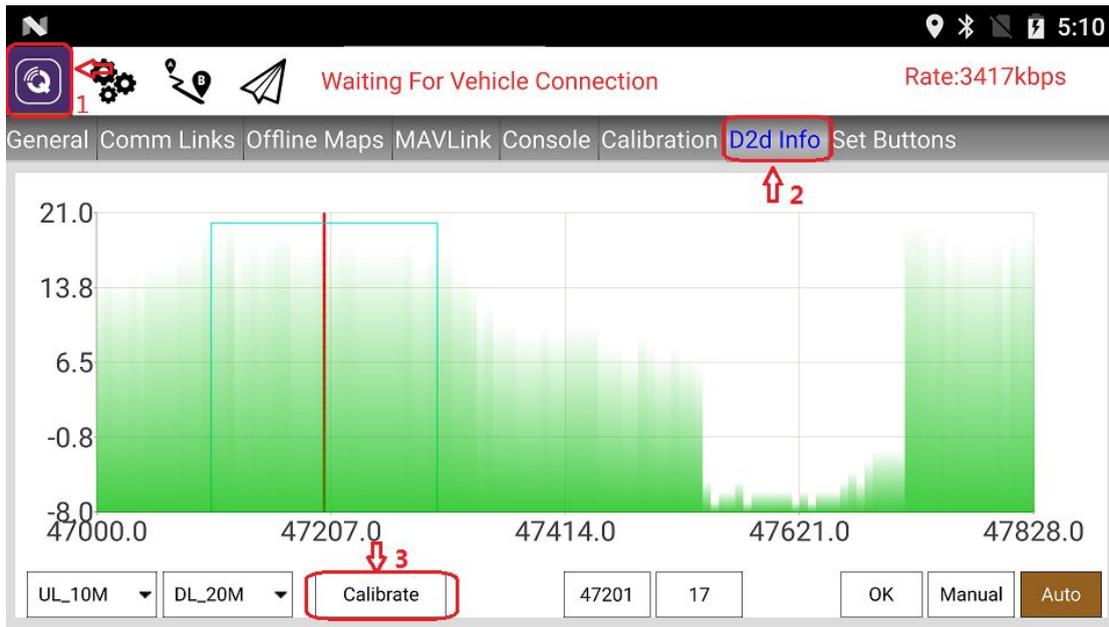
1.3 Controller interface

- The default interface of the remote control is QGC ground station
- If you want to disconnect from the aircraft, you can turn on the airplane mode.
- If you want to restart QGC, please click Settings - Application - QGC to stop the application and press the Home button to complete the restart.

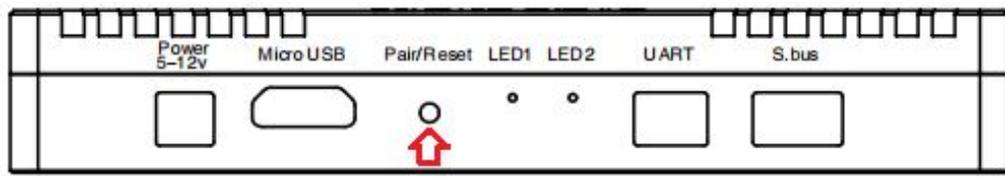
2. Air Unit Antenna Connection / Air Unit and Flight Control connection / Camera connection

3. Air Unit and controller frequency operation

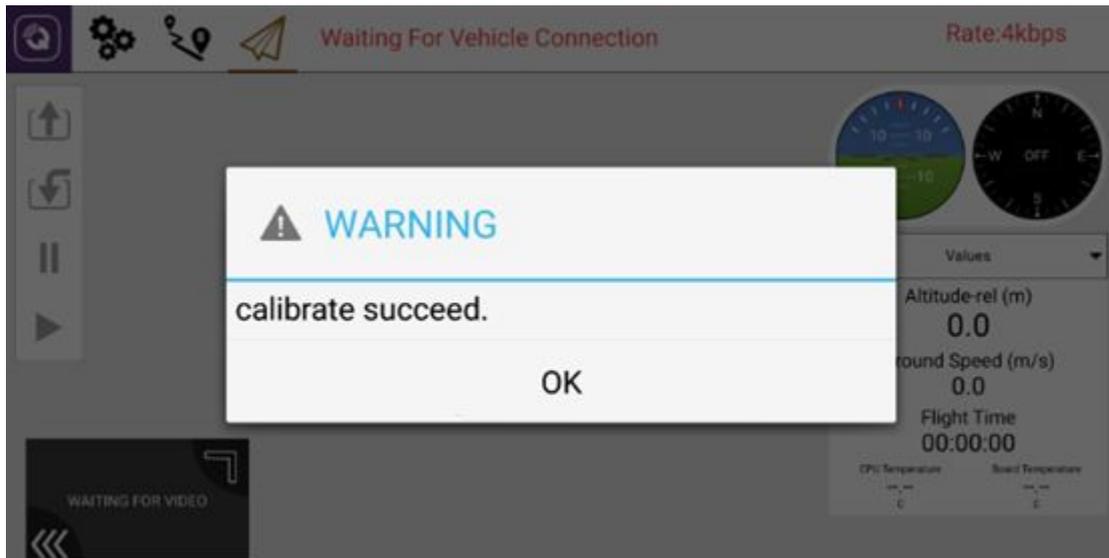
3.1 Turn on the remote control and the Air Unit modules. Tap Calibrate on the D2D Info interface to enter the code status. (The Rate and Clitest waveforms in the upper right corner of the QGC change in real time after the connection is established.)



3.2 At the same time within 30s, presses the code entity key for 3s on the Air Unit to make the Air Unit enter the code status (the Air Unit code button position is as shown below)



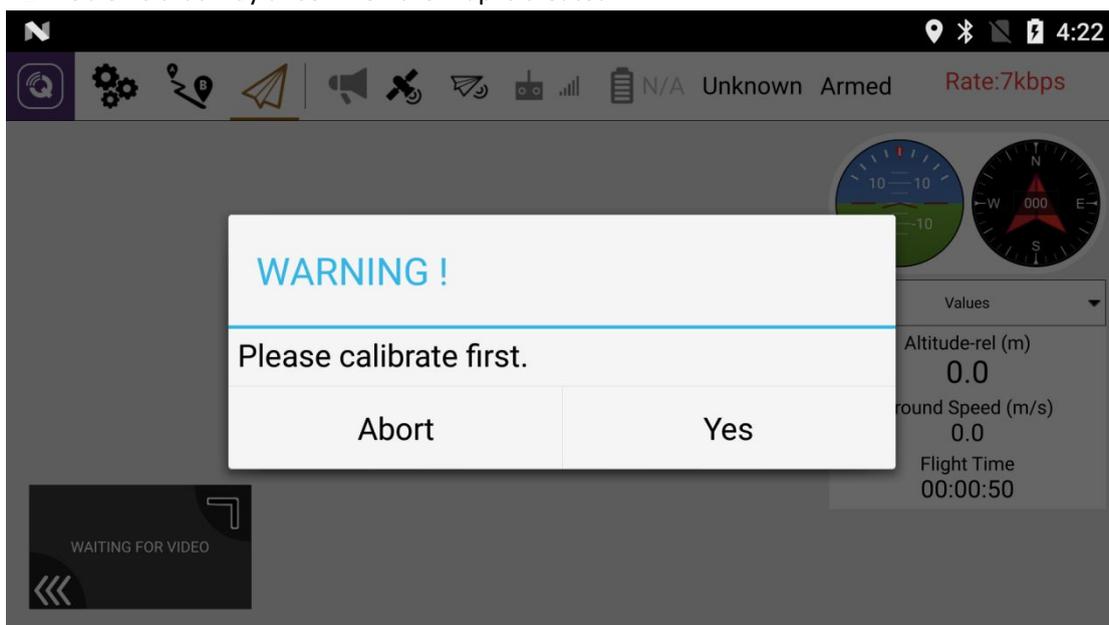
3.3 Wait and observe the remote control QGC. If the code is successful, it will prompt calibrate to succeed. Click OK to complete the code matching process. (If prompted calibrate failed, please restart the process)



4. Getting Video Stream to work

4.1 After the code is completed, the connection between the Air Unit and the remote end is established successfully. The Air Unit HDMI connects to the 1080P video input source, and the video frame in the lower left corner of the remote control QGC will display the Video. Click the video frame to display the full screen.

4.2 Problems that may arise when the map is created



4.2.1 The video frame shows WAITING FOR VIDEO, the upper right corner code rate fluctuates at a few kbps

Solution: Check if the video source HDMI output resolution is 1080P (QGC resolution setting must be consistent with camera resolution setting)

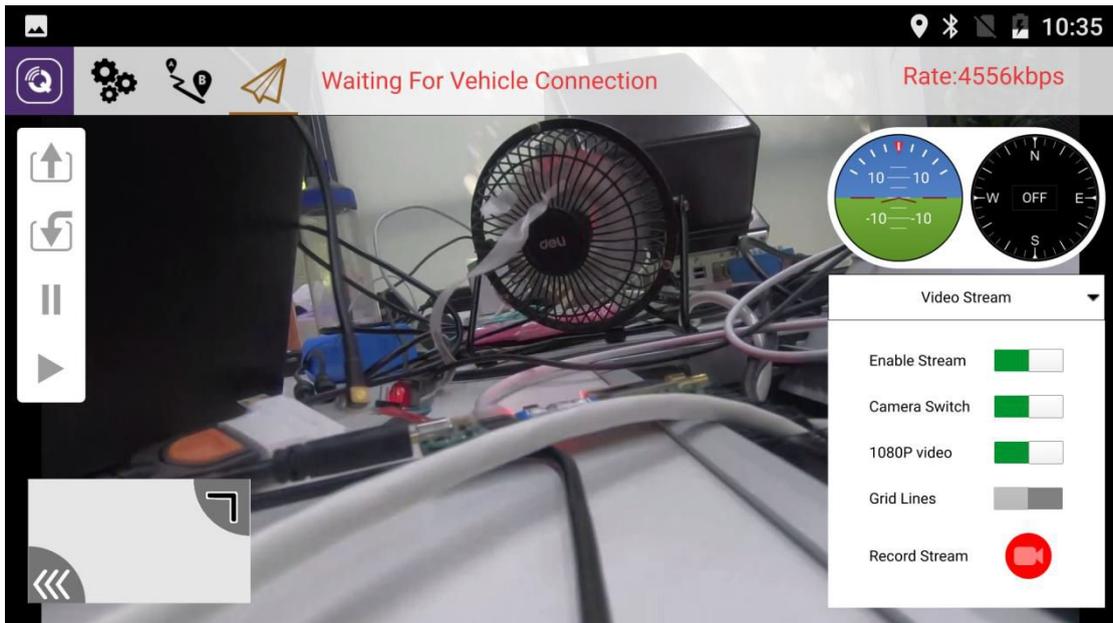
Is the HDMI connection secure or replace the HDMI cable?

4.2.2 The upper right corner link rate display 0kbps

Solution: Re-code or restart machine

5.Video Stream settings

5.1. Click on the airplane icon in the upper left corner and select Video Stream from the Values drop-down menu on the right.



5.2 Rate : Figure pass rate (related to wireless environment and scene changes)

5.3 Enable Stream : Map pass enable switch

5.4 Camera Switch: Sky HDMI dual video switch, use HDMI interface close to the power when off

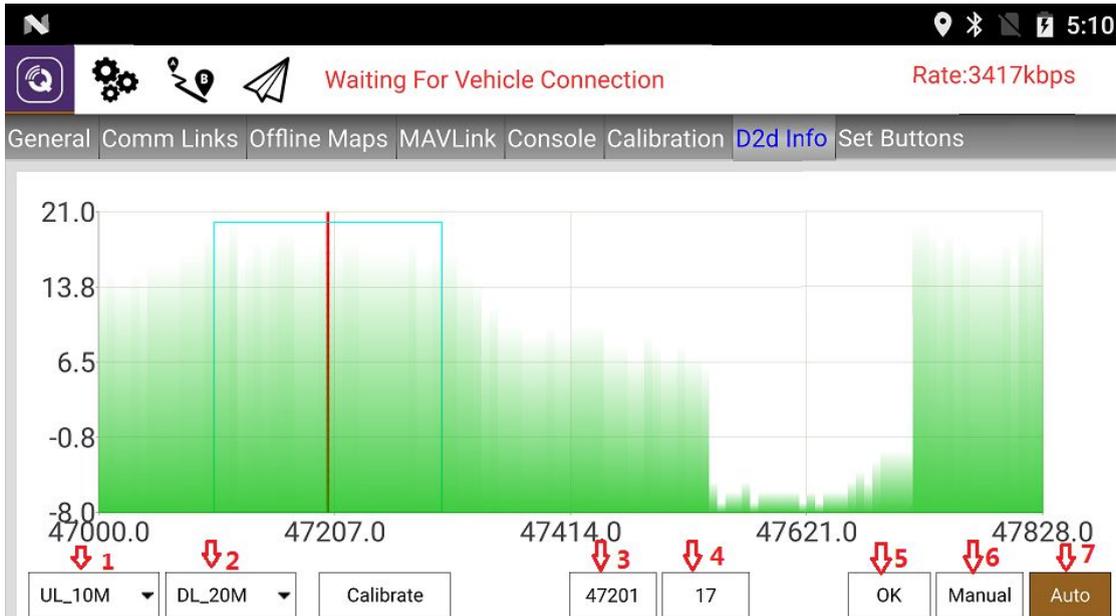
5.5 1080P Video : The resolution switch of the image transmission, when the image is turned on, the resolution is 1080P, and when it is off, it is 720P.

5.6 Record Stream: Recording switch, the video transmission path of the picture is /SDcard/QGroundControl/video on the airside module

5.7 Screenshot: Press the power button + C button at the same time, the screenshot storage path is /sdcard/pictures/screenshots

6. D2d Link Info settings

6.1 Click on the Q icon in the upper left corner and select D2d Info



6.2 X axis: frequency point, red line represents the current working frequency

6.3 Y-axis: SNR (signal-to-noise ratio), the larger the value, the smaller the interference

6.4 Upstream working bandwidth: Corresponding mark 1, support UL_1.4M / UL_10M / UL_20M Less interference, 20M for long distances and 1.4M for multiple interference scenarios

UL_1.4M	<input type="checkbox"/>
UL_10M	<input type="checkbox"/>
UL_20M	<input checked="" type="checkbox"/>

6.5 Downstream working bandwidth: corresponding to mark 2, support DL_10M / DL_20M
Less interference, 20M for long distances and 10M for multiple interference scenarios

DL_10M	<input type="checkbox"/>
DL_20M	<input checked="" type="checkbox"/>

6.6 Current working frequency value: corresponding mark 3

6.7 Current working bandwidth SNR value: corresponding mark 4

6.8 Frequency hopping mode: The enable key corresponds to the Auto of the marker 7. It is recommended to work in this mode to automatically select the best working frequency.

6.9 Fixed frequency working mode: the user selects the working frequency point according to the current wireless environment.

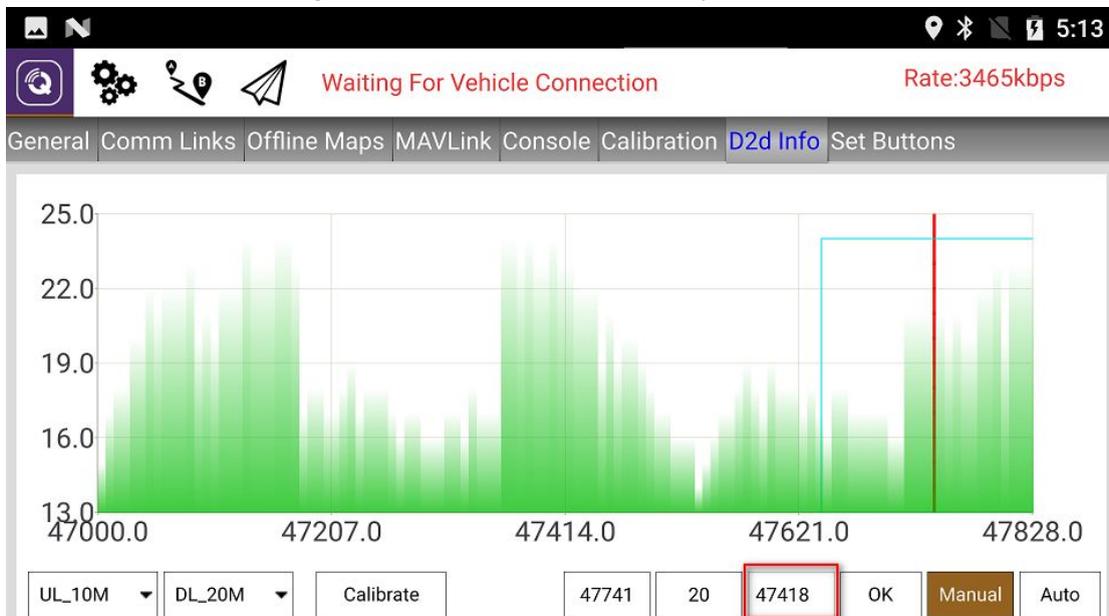
6.9.1 Enable the manual button corresponding to the mark 6 and click the prompt to succeed. Switch to the fixed frequency working mode.

6.9.2 Enter the target frequency point manually at the red mark as shown below or click the screen selection, then click the OK button, corresponding to the mark 5

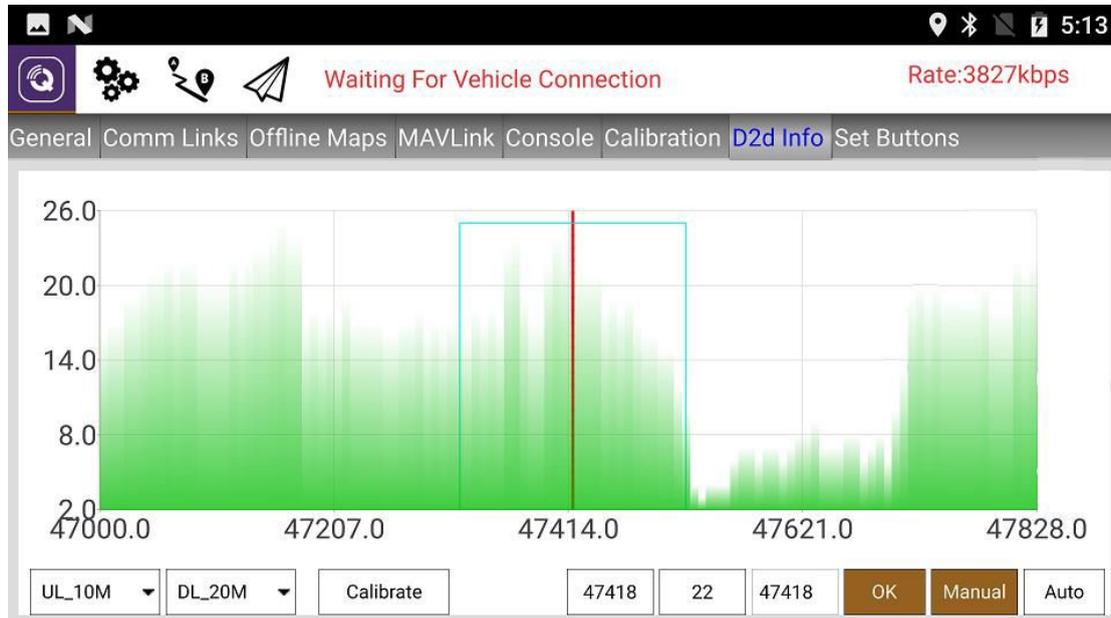
6.10 Manual input frequency range is as follows:

6.10.1 Downstream working bandwidth selection 20M corresponds to 47100~47735

6.10.2 Downstream working bandwidth selection 10M corresponds to 47050~47785



6.11 After the setting is successful, the prompt is successful. At this time, the working frequency has been set to the target frequency. 47418
(This value is for reference only, the actual working frequency is set according to the environment of its own use)



7. Introduction to Controller channel settings

8. Product upgrade instructions